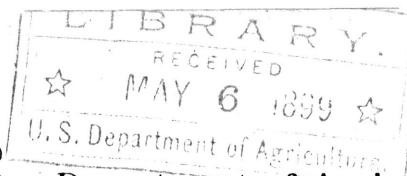


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United States Department of Agriculture, DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigations.]

THE FLAT PEA.

DESCRIPTION.

The flat pea is a variety of the woodland pea (*Lathyrus sylvestris*), which is not very different in appearance from the common sweet, or everlasting, pea. It is a perennial, enduring sometimes for

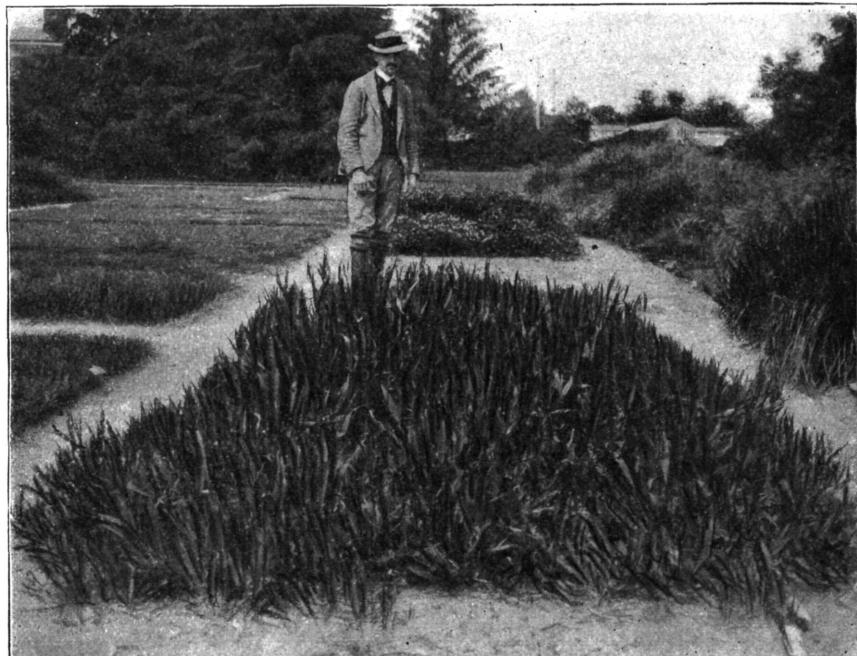


FIG. 1.—Plot of flat pea in the Grass Garden on the grounds of the Agricultural Department.

twenty-five years or more, has strong, deep, much-branched roots, and produces many trailing or climbing stems, which interlace in great tangled masses. The rather handsome rose-colored flowers are borne in loose clusters and are followed by pods not unlike those of the common pea.

This pea is a native of Europe, and is most abundant in the central and southern parts, extending into northern Africa. It is found in thickets and hedgerows, and on rocky hillsides, blossoming throughout the summer. A variety has long been cultivated for ornament in English gardens under the name of everlasting pea.

HISTORY OF ITS INTRODUCTION.

In 1862, Herr Wagner, an agriculturist of Kircheim-Teck in Wurtemberg, Germany, had occasion to visit the Little Carpathian Mountains, where he observed that, while all other herbage had been burned up by the intense summer drought, the masses of stems and foliage of *Lathyrus sylvestris* remained green and tender. It occurred to him that here was a good fodder plant for dry soils, the more so as this luxuriant growth was upon pure chalk rubble. But when Wagner put the *Lathyrus* to practical test he found it wanting in two particulars: first, it contained certain alkaloids which rendered it disagreeable and injurious to cattle; and second, the seed is protected by an exceedingly hard coat, so that it may lie in the ground for years without germinating.



FIG. 2.—Flat Pea (*Lathyrus sylvestris wagneri*).

Thinking that possibly these defects might be eliminated by cultivation, Wagner undertook the systematic improvement of the *Lathyrus*. As a result the bitter alkaloids were gotten rid of, and the hard, vitreous seed coat was rendered comparatively soft and pervious to moisture, so that germination took place in two or three weeks, instead of as many years, after sowing. This alteration was accomplished by yearly transplanting, each time to a better soil.

The improved variety of *Lathyrus sylvestris* thus brought into notice was named *Lathyrus sylvestris wagneri*, in honor of the cultivator. English agriculturists have named it "Flat Pea." It has received much attention in Germany, but has not yet been cultivated on an extensive scale. A great deal has been published about it, chiefly in newspapers and agricultural journals. In England it has excited some interest, and in the arid regions of Cape Colony its

cultivation has been attended with seeming success. In the United States practical agriculturists have not yet taken it up to any great extent. Several of the State experiment stations, notably those of Louisiana, Michigan, California, and Massachusetts, have grown the flat pea in a small way and have made chemical analyses of it. In Louisiana the success of the experiment has so far not been marked, although the experimenter admits that there has not been time for a fair trial of it. At the Michigan Station quite favorable results have been obtained, the yield being good and cattle relishing the fodder.

USES.

Owing to its power of taking nitrogen from the air, and therefore of growing without the aid of nitrogenous manures when once well established, the flat pea is thought to be especially adapted to comparatively poor, sandy, shaly, or "chalky" soils. Hence its greatest value should be as a soil renovator to restore nitrogen to ground which has been exhausted by cereals and like crops, or is otherwise lacking in sources of protein. This is a function largely delegated in the United States to the clovers and cowpeas. The *Lathyrus* is said to be a good binder for drifting, sandy soils, the strong, deeply penetrating roots forming a mesh which holds the particles of soil together. The roots are sometimes 20 to 30 feet long.

It is claimed that the hay of the Wagner flat pea makes an excellent fodder, much relished by cattle, sheep, and hogs, and contains more nutritive matter than most standard fodders. Owing to the high rate of nutritive matter in *Lathyrus* hay, it is recommended that it be mixed with one-third or one-half of straw. At the Michigan Experiment Station it was found that cattle relished the green fodder, but no report is made of its effect upon them. A writer in

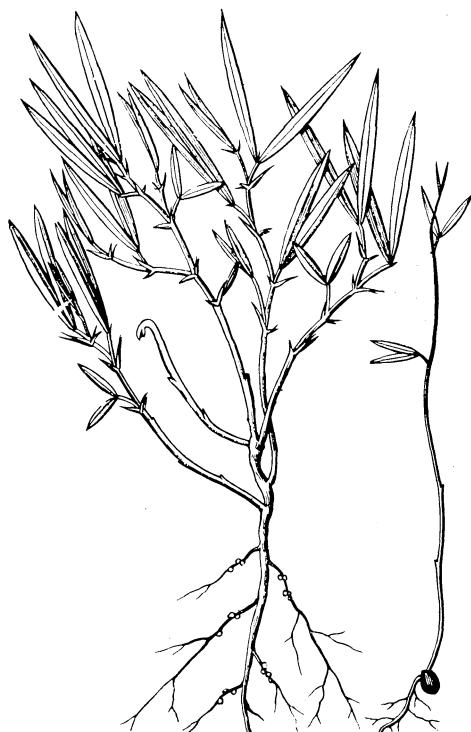


FIG. 3.—Young plants of flat pea. The one to the left shows the root tubercles.

Der Landbote, a German agricultural publication, states that a plantation of flat pea affords excellent "standing mast" for pigs, and the flowers of the *Lathyrus* are much frequented by bees, the honey from this source being exceptionally fine.

CULTIVATION.

German authorities recommend that the flat pea should be first planted in the seed bed, from which the young vines are transplanted to the locations where it is desired they finally should grow. It is estimated about 30,000 plants are needed for an acre. In a country so rich in forage plants as the United States, and especially where the methods practiced are so different from what they are in European countries, this manner of procedure is not likely to be followed. More economical and expeditious methods must be sought. One method recommended is that of planting the seeds in drills 15-20 inches apart, burying the seed to the depth of 3 inches, deeper if the soil is very sandy and the region dry, or less deep in heavy soils. The land should be prepared for receiving this crop the same as for wheat or corn, although it is claimed that the flat pea will grow in regions or in soils where these crops will not succeed. The young plants usually come to the surface within three weeks from planting and during the first season make a small growth, 10 or 12 inches perhaps. The land during this season should be kept free from weeds and the vines cultivated. The second year the growth is more vigorous and during the third year the plants attain their full size. In the Gulf States the vegetation is perennial, but in the latitude of Washington the plants die down in the winter, although they are quite resistant to frost and are slow in starting in spring. Their heaviest growth appears to be during the months of July and August, and at this season the vines make a dense mat, completely covering the ground, often to the depth of 3 or 4 feet. This tangled mass of vines is cut with difficulty and must be mown with a scythe or cut with a sickle. The vines, when cut, dry out readily and the making of the hay is a simple matter.

CHEMICAL ANALYSIS.

The analysis of the air-dried hay at the Michigan Agricultural Experiment Station is as follows:

	Per cent.
Water	7.99
Crude ash	8.32
Ether extract, fat, etc	2.08
Crude fiber, wooded matter	26.70
Nitrogen, free extract, starch, sugar, etc	27.74
Crude protein	27.17
	100.00

The following is an analysis made at the California Experiment Station with comparative analyses of the flat pea made in England, and of alfalfa. It is the general conclusion that although the amount of crude protein in flat-pea hay is very high, the plant does not commend itself for forage:

	FLAT PEA.		Alfalfa.
	California Station (cut before bloom).	England (cut after bloom).	
Moisture	63.48	58.63	67.46
Crude protein	8.18	7.44	5.91
Crude fat	1.63	2.05	1.15
Carbohydrates	13.77	16.58	12.02
Crude fiber	9.76	12.21	10.51
Ash	3.18	3.09	2.95
Total	100.00	100.00	100.00

NOTES FROM EXPERIMENT STATIONS.

The California Experiment Station reports that the flat pea maintains a heavy growth with very little moisture, keeping green all summer without irrigation. Cattle and horses will eat the hay, but avoid the green vines. Sheep and pigs eat it readily green. Flat peas grow best on upland, sandy soils.

The North Carolina Station reports that the flat pea requires three or more years to secure a stand and then it is of no practical value for North Carolina. "The flat pea we place next to sachaline as the most loudly trumpeted swindle perpetrated upon the long-suffering public in recent years."

The Alabama Station reports that flat pea grows 8 to 10 inches high the first year, withstands light frost, continuing to grow throughout the winter. Cows and horses crop the vines, especially before other plants have started. It is regarded as good a soil renovator as cowpeas.

At the Hatch Experiment Station, Massachusetts, the flat pea was cultivated for two years at considerable expense without securing any fodder.

The Nebraska Station reports that this fodder plant appears to be too tender to stand ordinary treatment and does not recommend it.

The Utah Station reports that *Lathyrus sylvestris* dried up during the summer of 1893, although it remained green several weeks after the alfalfa plants growing with it were dead.

The Kansas Station reports that young seedling plants of the flat pea withstood the drought satisfactorily.

In the Michigan Experiment Station report for 1895 it is stated that the flat pea had grown with fair success for several years, but the feeding tests showed that sheep and cows had a decided distaste for the forage. Sheep confined on flat-pea pasture lost weight, and cows fed in stable lost weight and diminished in production of milk and butter-fat when either green or ensiled flat-pea fodder was fed as a part of the ration.

CONCLUSION.

In localities where it will pay to go to considerable trouble in order to establish a growth of some forage plant, as in some of the sandy and arid regions of the West, especially in limestone and chalky regions of the Southwest, flat pea may be considered as having some possible value; but where other crops can be grown, such as Indian corn, the sorghums, wheat, rye, barley, clovers, or the ordinary tame grasses, it will not pay to cultivate this fodder plant. The deeply penetrating, tenacious roots and perennial habit exclude this plant from ordinary use in rotation.

Finally, it must be borne in mind that this plant, naturally growing upon sterile ground, was improved by continual transplanting to better soil. If sown upon poor soil, is there no danger that it will revert to its original state, regaining the injurious qualities lost in the course of improvement? The method of improvement—by continual transplanting to better soil—makes the probability of reversion great. Indeed, those who advertise the plant most extensively admit that many who raise seed for sale have, on account of careless cultivation, placed on the market seed of inferior or unimproved forms. Unless this can be stopped it is to be feared that the result will be the entire reversion of the improved variety.

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Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., April 28, 1899.

